

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A process to manufacture a fibrous, flat and electronically conducting material made of synthetic fibers, in particular synthetically spun fibers (e.g. acrylic fibers), comprising the steps of
 - first fibrillating staple fibers having preferably a specific length;
 - forming the fibrillated staple fibers into a continuous web in a paper manufacturing process, preferably by means of an inclined wire wet laid paper machine,characterized in that,
the continuous web is calendered at least once prior to its carbonization and then carbonized/graphitized through heating at a temperature of greater than 600 °C, to obtain electrical conductivity.
2. (Original) A process according to claim 1, characterized in that the carbonization takes place at a temperature greater than 800 °C, and very much preferred greater than 1000 °C.
3. (Currently Amended) A process according to claim 1, or 2,
characterized by an initial first temperature treatment that at least

partially softens or melts the fibres.

4. (Currently Amended) A process according to claim 1, ~~or 2,~~ characterized in that the flat material is fixed in a tenter frame prior to the carbonization process.
5. (Currently Amended) A process according to claim 1, one of claims 1 to 4, characterized in that the staple fibers are suspended in a solvent, preferably water, to form a pulp and are then fibrillated.
6. (Currently Amended) A process according to claim 1, one of claims 1 to 5, characterized in that the fibers are fibrillated in a refiner.
7. (Original) A process according to claim 5, characterized in that the pulp dilution in the refiner is approximately 0.1 to 0.01 %, preferably 0.05 to 0.02%.
8. (Currently Amended) A process according to claim 1, one of claims 1 to 7, characterized in that a mixture of fibrillated and non-fibrillated fibers is used.
9. (Currently Amended) A process according to claim 1, one of claims 1 to

MILLER

Appl. No. 10/unassigned

US National Phase of PCT/CH03/00366

December 6, 2004

8-characterized in that the fibrillated fibers are processed into webs with, a substance weight typically between 45 to 150g/m².

10. (Currently Amended) A process according to claim 1, one of claims 1 to 9, characterized in that fibers with a Titer of up to 15 dtex maximum, preferably up to 8 dtex maximum and especially preferred with a Titer of up to 3.0 dtex maximum are used.
11. (Currently Amended) A process according to claim 1, one of claims 1 to 10, characterized in that fibers with cut lengths between 4 and 40 mm, preferably between 8 and 12 mm are used to produce the continuous web.
12. (Currently Amended) A process according to claim 1, one of claims 1 to 11, characterized in that synthetic fibers of at least a first and a second type are used.
13. (Original) A process according to claim 12, characterized in that the fibers of a second type contain fractions of at least one noble metal or other additive, e.g. a synthetic additive.

MILLER

Appl. No. 10/unassigned

US National Phase of PCT/CH03/00366

December 6, 2004

14. (Original) A process according to claim 1, characterized in that the calendaring is carried out at raised temperatures.
15. (Currently Amended) A process according to claim 1, one of claims 1 to 14, characterized in that the web or material is calendered at least twice prior to the carbonization and such that all of the material is densified in a first calendaring step and at least one of the two opposite paper surfaces is changed into a film-like, porous material by melting the fibrillated fibers in a second calendaring step.
16. (Currently Amended) A process according to claim 1, one of claims 1 to 15, characterized in that the heat and pressure are selected, such that the calendered micro porous material has pore sizes of < 5 µm, preferably < 2 µm.
17. (Currently Amended) A process according to claim 1, one of claims 1 to 16, characterized in that synthetic fibers such as acrylic or Aramid fibers are used.
18. (Currently Amended) A process according to claim 1, one of claims 1 to 17, characterized in that non-crystalline fibers are used as synthetic fibers.

19. (Currently Amended) A fibrous, flat and porous material obtained from a process according to claim 1 ~~one of claims 1 to 18~~ further characterized in that the material has a core having a first porosity and at least one cover layer having a second porosity, said second porosity being less porous than the first porosity.
20. (Currently Amended) A material according to claim 19, characterized by a fibrous core {13} and at least one micro porous flat cover layer {15} on one side of the material that is more dense than the fibrous region {13}.
21. (Currently Amended) A material according to claim 19, ~~or 20~~, characterized in that the surfaces of the material opposite one another are micro porous flat cover layers {15} that are more dense than the fibrous region {13}.
22. (Original) Non-woven fabric comprising carbonized/graphitized polymeric fibres characterized in that the fabric has a core having a first porosity and at least one cover layer having a second porosity, said second porosity being less porous than the first porosity.

23. (Original) Non-woven fabric according to claim 22, characterized in that the fabric consists essentially of carbonized/graphitized polymeric fibres.
24. (Currently Amended) Non-woven fabric according to claim 22, ~~or 23,~~ characterized in that, the fabric is coated with a catalyst layer
25. (Original) Non-woven fabric according to one of characterized in that, the fabric is micro porous.
26. (Currently Amended) Non-woven fabric according to claim 22, one of claims 22 to 25, characterized in that, the fabric is made from one single web or layer.
27. (Currently Amended) Non-woven fabric according to claim 22, one of claims 22 to 26, characterized in that, such a fabric is made from two or more single webs and laminated to a single web.
28. (Currently Amended) Fuel cells containing at least two gas diffusion layers separated by an ionically-electrically conducting layer separating wall (PEM membrane), said gas diffusion layers being coated with at least one catalyst. characterized in that, each gas diffusion layer is

MILLER

Appl. No. 10/unassigned

US National Phase of PCT/CH03/00366

December 6, 2004

formed at least in part from a material having a fibrous core and at least one micro porous flat cover layer on one side of the material that is more dense than the fibrous region according to one of claims 20 to 22 and a non-woven fabric consists essentially of carbonized/graphitized polymeric fibres according to one of claims 23 to 29, respectively.

29. (Currently Amended) Use of a material obtained according to claim 1 one of claims 1 to 28 and a non-woven fabric comprising carbonized/graphitized polymeric fibres characterized in that the fabric has a core having a first porosity and at least one cover layer having a second porosity, said second porosity being less porous than the first porosity according to one of claims 22 to 27, respectively, as a micro porous support for a membrane, in particular a PEM membrane.